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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

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SUBJECT: Identification of Chemicals Of Concern (COCs) at Superfund Sites for the Baseline Risk Assessment

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TO: Contractors

The purpose of this memo is to provide guidance on the identification of chemicals of concern for the baseline risk assessment. This is general guidance and should be applied as appropriate on a site-specific basis.

Identification of COCs at NPL sites

The Agency (U.S.EPA) responsibility is to seek out man-made contamination sites, estimate true Total Risk to receptors on or near the site, and inform these receptors of their true Total Risk.

Generally, it is not Agency policy to seek out and inform receptors of their potential risk to Background only (=voluntary risk or no-choice risk).

However, true Total Risk at sites is considered to be equal to Background risk (accepted risk) + Man-made risk (unaccepted risk). Background risk, which is accepted, cannot be dissociated from Man-made risk (unaccepted risk) if true Total Risk is to be obtained.

In order to accomplish the goal of estimating true Total Risk at sites, Region 5 recommends to attempt to determine the presence of three types of COCs, namely, true, potential and background COCs.

True COCs are those on-site constituents whose maximum concentration in a data group exceeds a toxicity screen, and whose mean concentration is significantly higher (at α level 0.05) compared to background mean. For each data group, the concentrations for constituents must be compared to the appropriate background concentrations, using the T-test, to determine which constituents are significantly elevated above background and should be considered as true COCs for that group.

Potential COCs are all on-site constituents whose maximum concentration in a data group exceeds a toxicity screen; but that are not tested statistically because

- a) there were not enough samples to perform such analyses, or

b) media samples and background samples were analyzed differently (e.g., different detection limits) resulting in data not amenable to reliable statistical analysis - especially at low detected levels. For example, a constituent from residential wells cannot be reliably compared to background wells because of different detection limits (SAS vs RAS), or c) of other criteria employed in selecting COCs that precludes the inclusion of the constituent in a data group. For example, a constituent can be initially excluded from the on-site ground water group because it was not detected in the cluster of highest concentration wells. However, its presence and concentration in other parts of the plume shows that it exceeds the toxicity screen. Furthermore, if mean comparisons with background were possible to perform for this constituent, it would be expected to be a true COC.

Background COCs are all on-site constituents whose maximum concentration in a data group exceeds a toxicity screen, but whose mean concentration is not significantly different compared to background mean.

It is essential to follow the above protocol in order to determine true Total Risk at a site because of the consequential impact it will have on decision making at the site, for example, whether to cleanup or not, and exactly which chemicals and areas to cleanup. It must be understood that constituents detected at background level (e.g., background COCs) are not expected nor required to be cleaned up. However, at some sites they may play a pivotal role in deciding whether cleanup is warranted or not. It is for this reason that Region 5 recommends such a methodology to attempt to identify the types of COCs present at a site.

For purposes of Risk Assessment, it is not necessary to report true Total Risk as part of the regular Baseline Risk Assessment. If, however, background COCs are identified at a site, it is necessary to report true Total Risk, as an addendum, and to reference it in the regular Baseline Risk Assessment.

The value of correctly identifying chemicals of concern at sites to estimate true Total Risk is often critical. Such information is essential for an accurate assessment of human health risk from the site. If you have any questions regarding this matter, please contact me at 312/886-7573, or any other Superfund toxicologist/risk assessor.